



Laser Photo Courtesy of the FAA

# The Laser Threat to Helicopters

By Chuck Angle • [rwcfii@charter.net](mailto:rwcfii@charter.net)

## Have a Plan

We live in a world of constant change as technology continues to deliver new and useful tools that enrich our lives and increase our productivity. Unfortunately, some of these devices can be used to harm society; the laser being one. I won't bore you with a lot of technical data about how different lasers can harm us as individuals or how easy they are to obtain. However, one must realize that lasers are out there; in the hands of irresponsible individuals and you are likely to

become a victim. Therefore, you should have a plan.

I recently retired from working as a pilot for a large, well motivated and very professional police department. During my tenure of 12 years, our aviation unit was attacked by a laser three times. All three incidents resulted in arrests thanks to the dedication of the police patrol units. There were two convictions and one other that will shortly go to trial. I was the pilot for two of the incidents and I hope this information will be of use to you when and if you are victimized.

## Under Laser Attack

The first incident occurred late at night about two miles south of an international airport in Class B airspace. We were flying in support of a K-9 (police dog unit) that was tracking an individual who had assaulted someone with a knife at a party. We were in a left hand orbit at an altitude of about 1200 feet AGL (above ground level) when the entire crew compartment lit up with a quick very bright, green flash. It was not unlike a very green strobe light. I quickly asked the crew if anyone had a

CONTINUED ON PAGE 2

VOLUME 22 • NUMBER 1 • 2011

## HumanAD

AIRWORTHINESS DIRECTIVE FOR HUMANS

VIRGINIA STATE POLICE AWARD .... 3

BELL HELICOPTER TRAINING ACADEMY SAVED OUR LIVES..... 4

SPEAKING OF SAFETY ..... 6

GERMAN ARMY TRANSPORT HELICOPTER REGIMENT 10 ..... 7

AWARDS & RECOGNITIONS..... 8

PRESORT STD  
US POSTAGE  
PAID  
PERMIT 1859  
FORT WORTH, TX

P.O. Box 482 • Fort Worth, Texas 76101

A Textron Company

**Bell Helicopter**

# The Laser Threat to Helicopters continued from page 1 . . .

green lens flashlight. No one had such a flashlight onboard but the rear crewmember, who operates the FLIR (forward looking infra-red), said it had happened about five minutes ago but with a very dim beam.

We continued following the K-9 unit making sure there was no one ahead or behind who could initiate a surprise ambush. About five minutes later that we were hit from the front by a green laser. We later determined it was less than a mile away and directly in front of us. I was wearing NVGs (night vision goggles) and thus somewhat protected. The front seat flight officer (FO) had his head down and off to the side. Despite the protection of the NVGs it was a painful experience, like getting hit on the forehead with a green hammer. My vision was temporarily gone.

## Temporarily Blinded

Instinctively, I maneuvered to the right and away from the area of the light. I turned on my lip light (a small light mounted on the helmet mike) and looked under the NVGs at the artificial horizon which I could barely make out due to my blurred vision. However, I was able to continue the turn.

We all agreed what the problem was and generally where the laser was coming from. But K-9 was still in hot pursuit chasing the knife-wielding attacker. We agreed to continue with the current mission despite our own problems. I notified the control tower of the laser episode using a ground control frequency in case the individuals were monitoring ATC (air traffic control). The control tower then immediately diverted all landing traffic to a runway where the approach was clear of the laser.

The experience of being hit in the eyes by a laser was like flying on instruments at night with lightning flashes firing all around. I turned all of the flight instruments to the "full bright" setting and took my Nomex flight gloves and draped them over my NVGs. I wrapped them around and under the lenses to block out all but the very bottom in order to see the cockpit instruments. The flight officers went "heads down" and shielded their outside view with the large map books we carried.

In the space of 15 minutes we were hit by the lasers at least seven more times. This was definitely an intentional act. By knowing the aircraft's position and the side we were hit, it was easy to determine the general area of the laser shooter. When the K-9 unit ended their call, we notified ground units of our laser problem and the location we estimated it was coming from. They were very eager to find the individuals responsible and put a stop to it. They quietly swarmed into the neighborhood to assist ground units with tracking. As we advanced toward the laser source, we were continuously lased.

The rear seat FO located the individuals in a back yard using the FLIR unit. The laser is viewed as a very bright "sparkle" in the FLIR but does not impair the FLIR image. The front seat FO maintained his head completely down and protected using the map in front of his face as a shield. I was looking to the side and down with the NVGs. The FLIR operator vectored me to the laser site. Ground units could see the laser shooting into the air. As we flew over the suspect's house, three individuals ran inside. Ground units then surrounded the house, thus putting an end to the laser "attack." Three individuals were detained until a search warrant was obtained.

## Another Laser Attack

The second incident occurred 18 months later, again late at night. We just finished a mission and were returning to our base heliport when about one-half mile southwest of our region's level-one trauma center hospital. This time the laser hit the left side of our helicopter, but we were all wearing NVGs which probably saved us. Immediately, we turned away and carried out the same steps as on the previous event and then began to search for the laser source. I notified the hospital heliport control center and ATC of our situation. As luck would have it, one of the FOs was very familiar with the immediate area and was able to pinpoint the laser's source. Once again, ground units were successful and arrested the individuals.

The primary reason I am writing this article is to ask that you be prepared in this seemingly unlikely event. Until the laser attack happened to our crew, it

VOLUME 22 • NUMBER 1

**Heliprops**

Helicopter Professional Pilots Safety Program

The HELIPROPS HUMAN A.D. is published by the Training Academy, Bell Helicopter Textron Incorporated, and is distributed free of charge to helicopter operators, owners, flight department managers, mechanics and pilots. The contents do not necessarily reflect official policy and unless stated, should not be construed as regulations or directives.

The primary objective of the HELIPROPS program and the HUMAN A.D. is to help reduce human error related accidents. This newsletter stresses professionalism, safety and good aeronautical decision-making.

Letters with constructive comments and suggestions are invited. Correspondents should provide name, address and telephone number to:

Bell Helicopter Textron Inc.  
John Williams, HELIPROPS Manager  
P.O. Box 482, Fort Worth, Texas 76101  
817.280.3688, fax 817.278.3688

or the Comment/Feedback link at: [www.heliprops.com](http://www.heliprops.com)

RELEASE STATEMENT: For photos or written submissions, please include a brief statement releasing your material to Bell Helicopter for use in the Human AD newsletter.

**HumanAD**   
AIRWORTHINESS DIRECTIVE FOR HUMANS

# Virginia State Police Award

seemed like a very remote possibility. But, now it is essential for law enforcement and first responders to have a plan of immediate action. Your plan may not be exactly what our crew did, but it is paramount not to get hit in the eyes. I have heard some discussion and people often scoff at having a plan by rationalizing, "You can't plan for everything." That may be true, however, it is a lot easier to have a plan in place and then modify it than make one up as you go.

**The following are some steps you can take to help guard your crew:**

- 1. Protect your vision (close your eyes, look away, wrap your gloves around the NVGs)**
- 2. Turn away from the laser source and increase the cockpit lights "full bright"**
- 3. If possible, lower your seat**
- 4. Notify ATC and Law Enforcement**
- 5. Note your location and general location of the laser**
- 6. If possible, continue the flight without alerting the criminals of their impact and causing them to flee. Don't let the criminals know they can affect us. It will only encourage them and give others like them the incentive to continue these attacks.**

That's my plan. Do you have one? If I have learned anything in 43 years of flying it is this: Those that plan and practice, succeed. Those that do not plan eventually fail or worse yet cause someone else to fail.



*Sergeant John Ratliff (2nd from left) and Trooper Ron Addison (2nd from right) receive a Certificate "For Outstanding Flight Achievement" from Bell Training Academy Director, Trey Wade in ceremonies at the Bell Training Academy. Pictured (left to right) Bell Sr. Flight Instructor, Larry Sommers, Sgt. John Ratliff, Virginia State Police Lieutenant Robert Possumato, Trooper Ron Addison and BTA Director, Trey Wade.*



*A remarkable save. VSP Pilots Sgt. John Ratliff and Trooper Ron Addison executed a 180 degree autorotation from 250 feet and 80 knots into a confined area. The touchdown was to a slope following a forced landing (engine failure). Bell President and Chief Executive Officer John L. Garrison signed the citation.*

# Bell Helicopter Training Academy Saved Our Lives

By John W. Brantigan, M.D., ATP • [jbrantigan@rockisland.com](mailto:jbrantigan@rockisland.com)

*Editor's note: This article was originally a letter sent to Bell's Chief Flight Instructor, Marty Wright as heartfelt thanks for normal emergency procedure training at the Academy. The value to this reading audience is the account described by Doctor (and Mrs.) Brantigan as an honest reflection of the "human errors" which led to the water ditching of their Bell 47.*



**"A positive, helpful attitude and a dedication to making our flying safe in case of emergency and the training paid off."**

## About the Author

About the Author: Dr. John W. Brantigan is a retired medical doctor, lecturer, medical inventor, textbook author, helicopter and fixed wing pilot. His medical research included studies to validate a new aerospace-grade material, carbon fiber reinforced polymers for use in human spinal reconstruction. John and Carolyn own and crew a Bell 206B and a Cessna Citation CJ2. John served as a Flight Surgeon in the US Air Force (1971-1973) and in 2009 received the "Distinguished Alumnus Award" by Johns Hopkins University. Carolyn began her flying career in 1994 and is a Private Pilot with helicopter, fixed wing, multi-engine and instrument ratings.

My wife Carolyn and I would like to thank the Bell Helicopter Training Academy for saving our lives in several ways on June 8th. At that time we owned two Bell helicopters. Our first was a Bell 47G-4A in which we both received our initial helicopter training. After passing our check rides, we purchased a Bell 206-B3 Jet Ranger as a second aircraft then attended the Bell Training Academy, in October 2005. We live on an island in Washington State and use the Jet Ranger regularly to travel to the mainland. We brought the Bell 47 to our island home only last fall after we had it fitted with fixed floats; the Jet Ranger was already on pop-up, emergency floats.

On June 8th we decided to fly the Bell 47 since it was a nice day and we hadn't flown it in several months. I was the pilot on this flight. We departed the field to the north. Carolyn noted that the carburetor temp was in the yellow and asked if I wanted her to add carburetor heat. I told her to go ahead. I watched as she reached for the lever, but I couldn't see her action because her hand was in the way. I looked away because we were just clearing the tree tops. Less than a minute later we reached the shoreline and I turned left at 70 mph indicated and 300 feet, still climbing. Carolyn reached up and made a second adjustment and the engine sputtered.

Hoping that the engine was merely running rough, I initially raised the collective slightly to see if I had useful power. This error was due to a toxic combination of surprises: confusion and denial. With no power response, I immediately lowered the collective and entered autorotation. I believe I got the collective down in about two seconds which would have been a fatal delay in

some helicopters. Bell's design of the high-inertia rotor system of the Bell 47 saved our lives. I noticed that the red mixture control had been reduced half way to idle cut-off.

I flared above the water and touched down at about 15 mph with no perceptible impact. The helicopter flipped upside down. The bubble broke and water engulfed us. We released our seat belts, escaped to the surface and climbed onto the inverted helicopter. Within three minutes three separate neighbors arrived in boats and took us ashore. We had no injuries and believe that if we had not flipped inverted, there might have been little or no damage.

When Carolyn and I first attended Bell Training Academy, we had never done an autorotation to touchdown, and we had little understanding of what to do at the bottom of an autorotation when power recovery was not available. Because of our training at Bell we both had a keen instinct of how to complete the autorotation and Carolyn called "flare" at the moment I did the maneuver. Several of your instructors told us that if we ever autorotated into the water, we should count on being upside down since the front of the floats will dig into the water above about 5 mph.



*Pictured Above: John and Carolyn Brantigan*

By the time we had dry clothes, talked with the Coast Guard, the local sheriff's office and the FAA, we noticed that Seattle's King 5 TV helicopter was orbiting overhead. They landed at the Shaw airfield to interview me. So, I led the 11 P.M. Seattle news saying, "It wasn't the helicopter's fault; we made a stupid mistake."

We are not totally certain exactly what happened to the mixture control. Previously, the lever was so stiff that it was very difficult to move. Several months earlier we had our mechanic put in a new cable. Before the accident flight I was alarmed about how easy the lever moved, but I failed to contemplate that it might vibrate down. Carolyn believes that before her first adjustment she studied the round, red mixture control and the square black carburetor heat control and moved the correct one. She knows that during her second adjustment she tapped the lowest lever which was the mixture control. Carolyn believes that the mixture control vibrated partly down by itself. We did not mention this to the FAA because there was no doubt that the engine stopped because she adjusted the wrong control. Both of us had the opportunity and the obligation to monitor the positions of the two levers. Two professional pilots had flown the Bell 47 with the new mixture cable and hadn't perceived a problem. It wasn't our mechanic's fault. We attribute the accident to pilot error times two. But we wish we hadn't made the mixture control easy to move.

We did a few things right. We outfitted the Bell 47 with floats before we flew it over water. With floats, we preferentially fly over water rather than over the rocks and trees of our islands. We were a hundred feet off shore because we intended to be there. We were in the correct location in the height-velocity diagram, and we did our training with Bell. We were glad we were not wearing life vests, particularly the kind that inflates automatically when exposed to water.

I did the math. At 60 mph, 300 feet straight down takes 3.0 seconds. At a 45-degree angle of autorotation, it's 4.3 seconds. The two-second delay in lowering the collective would not be a straight subtraction, but I figure we were in the air about three seconds once the collective was down. It couldn't have been more than ten seconds from flying normally, to swimming beside the inverted helicopter.

At Bell Training Academy, Carolyn and I always have far less experience than the other students. Most are professional helicopter pilots. At times, I am nervous and don't fly well. I have flown with five or six of your instructors. All have had Carolyn and I owe our lives to the excellence of Bell Helicopter design and to the excellence of your instruction at Bell Helicopter Training Academy. We send our sincere thanks, and welcome you to share or publish this letter in any way that will encourage other helicopter pilots to participate in your training.

# Speaking of Safety

By John Williams • [jwilliams2@bellhelicopter.textron.com](mailto:jwilliams2@bellhelicopter.textron.com)

## Hand-held Lasers; a Bigger Problem for Helicopters Than You May Realize

Chuck Angle's laser article describing his experience of being lased led me to look further into the problem. After a little research and discussion with some experts in the field, I quickly realized the magnitude of this problem was greater than expected. In an FAA Press Release dated January 19, 2011 the release begins, "The FAA announced today that in 2010, nationwide reports of lasers pointed at aircraft almost doubled from the previous year to more than 2,800." Editor's note: According to FAA sources, a large number of reports were from helicopters.

If you think this is uniquely an "American problem," think again. Most of the lasers aren't made in the USA, but overseas. Good and harmful lasers are available and used worldwide. Along with legitimate laser users, criminals of all variety, drug dealers and terrorists have easy internet access to this new "weapon of choice" against those that fly. As Chuck Angle suggests, we must have a plan.

For more information about lasers go to:

- [http://www.faa.gov/pilots/safety/pilotsafetybrochures/media/laser\\_hazards\\_web.pdf](http://www.faa.gov/pilots/safety/pilotsafetybrochures/media/laser_hazards_web.pdf)
- [http://www.faa.gov/news/press\\_releases/news\\_story.cfm?newsId=12298](http://www.faa.gov/news/press_releases/news_story.cfm?newsId=12298)

To report a laser incident, refer to Advisory Circular (AC 70-2) – "Reporting of Laser Illumination of Aircraft" and complete the form. Or, go to the following FAA link:

- [http://www.faa.gov/regulations\\_policies/advisory\\_circulars/index.cfm/go/document.information/documentID/23081](http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23081)

## SMS...Simply Yes

How is your Safety Management System (SMS) plan coming along? The usual response is either a blank stare or a "deer in the headlights" look. By now, most aviation professionals have heard of the term. It is especially true in countries that require an SMS to operate.

Safety management is just that, managing safety. Why is it important to have a safety plan? Look at it this way; if you were the passenger on a helicopter wouldn't you expect the pilot to know what to do in the event of an emergency, such as an engine failure? The pilot should have rehearsed the emergency procedure over-and-over until it was second nature.

An organization (helicopter operation) should not wait until they experience a helicopter accident to decide

what to do. Like the pilot, he must have procedures to follow in the event something goes wrong. The size of an organization generally dictates the amount of governmental oversight it requires. What about the smaller operation, one or two aircraft; do they need an SMS? Absolutely. If you don't have a risk management plan, then you are vulnerable no matter what your size.

Do you need an SMS for your organization? You can find the latest at: [www.IHST.org](http://www.IHST.org) under the "Safety Resources" tab. The International Helicopter Safety Team (IHST) has been the driving force in the helicopter industry to make a safety management plan available at no cost.

Professionals must know what to do in the event of a worse-case event. Establish a plan to lower the risk. There are other benefits of the Safety Management System so it is worth the investment.

## Making a Critical Decision to Land

Don't entirely give up your "seat of the pants" flying skills. All too often we become so dependent on the "process" and technology to solve all our airborne problems. And there may be situations when the instrument readings look normal but you feel something is wrong.

Of course, not every "bump" means disaster or you would never get very far into the flight. One key indicator of a problem is an unexpected sound or any significant change in the rotor or airframe vibration level that was not there at takeoff. It is essential to recognize what the vibrations and sounds were like during normal flight conditions so if there were a change you could better compare (by feel or sound) something that is not right. You must be knowledgeable of your aircraft's systems but also sensitive to how it feels and sounds.

When an unusual event happens, quickly evaluate whether the flight can continue or an immediate landing should take place as a precaution. Pilots would agree that it is better to figure the problem out on the ground than in the air. Although inconvenient for them, the passengers likely would agree.

The bottom line should be, "when in doubt...don't." In other words, do not take any chances with the unknown. Pride has nothing to do with good decision making. Professional pilots would land rather than running the risk of an accident. Being near an airport doesn't mean you should pass a closer open-area to land. Think back

to accidents you have heard about and how many were because the pilot tried to “make the airport.” It may be inconvenient to recover an aircraft offsite, but a crash would be much harder to handle.

### **Aviation Safety Pioneer Retires**

The Chief of Flight Safety, Roy Fox retired from Bell Helicopter after a lengthy career spanning 45 years. Roy was instrumental in bringing an “engineering approach” to accident investigation that influenced industry and governmental aviation authorities, worldwide.

In 2005, Roy published a paper, “The History of Helicopter Safety,” first presented at the International Helicopter Safety Symposium in Montréal, Québec. The paper became one of the foundation studies that provided the metrics for analysis of helicopter accident causes. The International Helicopter Safety Team (I.H.S.T.) was then formed with the goal of reducing helicopter accidents by 80% in ten years (2016). Roy’s immediate plans include the restoration of his 1956 Porsche, however, I expect he will be close by to support helicopter aviation safety initiatives for a long time to come.

## **Certificates of Recognition for the German Army Transport Helicopter Regiment 10**



**Above:** A formation of pilots and crew chiefs with the German Army Transport Helicopter Regiment 10 each received “Certificates of Recognition” for their Bell Helicopter flight time and at ceremonies in Fassberg, Germany.

**Below:** Lt. Colonel Bernd Mueller-Keil exchanges Bell Helicopter Flight Time Certificates with Commander, Colonel Martin Weissenfels. The German Army Transport Regiment 10 has a distinguished service record in many worldwide theaters of operation.



# Awards & Recognitions



## BELL HELICOPTER AWARD PROGRAMS

Many Bell pilots and operators have requested information on what type of Bell Helicopter wings and safety awards are available to them. There are two ways to obtain recognition for pilots who fly Bell helicopters. The first recognition is a Pilot Safety Award issued on the basis of safe flying hours in Bells. The second is a wings award based on the pilot's flight hours in Bell helicopters. It is possible for a pilot to obtain both awards.

### Bell Flight Time Wings Award

The second recognition is for a pilot's flight time in Bell Helicopters. The Bell Training Academy issues this Certificate of Achievement and a Wings Lapel Pin in the following flight time hours:

- 1,000 hrs.** plain wings pin + certificate
- 5,000 hrs.** 5,000 hr. wings pin + certificate
- 10,000 hrs.** 10,000 hr. wings pin + certificate
- 15,000 hrs.** 15,000 hr. wings + certificate
- 20,000 hrs.** 20,000 hr. wings + certificate

**Example:** If a person had 6,500 hours in Bells he would receive a 5,000 hour pin, although the certificate would read 6,500 hours. Their next opportunity for a higher hour level pin would be at the 10,000 hour level.

For the hour level recognition to be awarded, the pilot (or company) must provide the following: Name of pilot as they would like it printed on a certificate, a verified flight time in Bells by either the Chief Pilot or a Company Administrative Official. In the case of an individual pilot making the request, a signed copy of the page in the pilot's log book that verifies the hour level for the wings requested. Mail or email the information (including

copy of documentation) to John Williams at: [jwilliams2@bellhelicopter.textron.com](mailto:jwilliams2@bellhelicopter.textron.com). Bell Helicopter Textron Inc., John Williams, HELIPROPS Manager, P.O. Box 482, Fort Worth, Texas 76101 USA

### Pilot Safety Award

Recognizing an individual pilot for flying safely is far too rare. Most pilots only hear of mistakes made by another pilot in an accident. Bell provides a Pilot Safety Award certificate for hours flown without an accident in a Bell helicopter. This can be achieved in either military or commercial aircraft. The award is given in thousand hour increments to recognize those pilots with a proven commitment and history of safe flying. To apply for this recognition certificate, please send a request letter from the chief pilot, CEO, military commander, or other individual who can confirm how many accident-free flight hours you have flown in Bell helicopters. If you are an individual pilot/owner, you can write the statement yourself. Let us know how you would like the name to appear on the certificate. If you want to include a military rank, you need to indicate that.

The award is maintained through the Bell's Flight Safety Department within Bell Engineering; Richard Wright ([rwright@bellhelicopter.textron.com](mailto:rwright@bellhelicopter.textron.com)) is the Bell point of contact. His mailing address is: Bell Helicopter Textron Inc., Attn: Richard Wright, Dept. 9A, Group 59, P.O. Box 482, Fort Worth, TX 76101 USA

The pilot's name and safe flight hours are posted on Bell's Flight Safety web page [www.heliprops.com](http://www.heliprops.com). Follow the link to the Heliprops Pilot Safety Award Program.

## The Past

President Harry Truman with Bell Founder, Lawrence D. Bell standing next to the experimental Bell Model 30, Ship 1A helicopter. The historic Model 30 is on display at the Smithsonian National Air & Space Museum's Steven F. Udvar-Hazy Center located near Washington Dulles International Airport.



## Looking Ahead

The Bell 407GX features a glass cockpit (state of the art instrumentation) with safety enhancements developed by Garmin.



## Subscription Form

- I would like to request a free subscription of the HELIPROPS HUMAN A.D.
- I would like to renew my free subscription of the HELIPROPS HUMAN A.D.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY/STATE/ZIP/COUNTRY \_\_\_\_\_

MAIL, FAX, OR EMAIL TO: Bell Helicopter Textron Inc., John Williams, HELIPROPS Manager, P.O. Box 482, Fort Worth, Texas 76101 • Fax 817-278-3688 • e-mail: [HELIPROPS@bellhelicopter.textron.com](mailto:HELIPROPS@bellhelicopter.textron.com)

Subscribe online at  
[www.heliprops.com](http://www.heliprops.com)